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### (54) A fluid distributor valve

Fluidumverteilungsventil

Une valve de distribution de fluides

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**US-A- 3 779 269 US-A- 4 077 424  
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**Description**

[0001] The invention relates to a fluid distributor valve.

[0002] Although this distributor valve can be used in different facilities and for different purposes it has been preferably provided to be used in conjunction with swimming pool bottom flushing devices, said devices comprising several nozzles installed in the swimming pool bottom and through which a water jet is radially ejected flush with said bottom.

[0003] Distributor valves provided to fulfil said function have been commercially available for a number of years, said valves generally comprising a chamber with a water inlet opening and several water outlet openings (one for one or more nozzles), each of said openings comprising a stopper being actuated by means of a reducing gear acting by virtue of the action of the infeed water on a rotor with which said gear is engaged.

[0004] A fluid distributor valve of this type is the subject matter of Patent No. US-4 592 379, comprising a chamber formed by a body and a bonnet, and having an intermediate plate through which a central shaft extends, a rotor being fitted around said shaft that is submitted to the action of the fluid circulating through said chamber, said body having fluid outlet bottom orifices, being each closed by a respective stopper, said stoppers being prised open by means activated by a reducing gear connected to said rotor.

[0005] This invention has as its object a valve sensibly improving the known valves, one of said improvements consisting in the presence of one only device with external control means allowing to control the time during which each outlet opening will be held open as well as to arrest the valve in a given position wherein one only outlet opening is held open.

[0006] Another of the advantages consists in closing each of the outlet openings or orifices by means of a respective flap, said flaps allowing to assure that a flap won't be closed till the next one is opened, said flaps having a flat seal assuring a tight closure.

[0007] The valve operation controlling and arresting device consists in a cylinder being integral with a central shaft being vertically shiftable from an external control means, said cylinder being slidable within a diffuser coaxially installed inside the rotor and forming part of an intermediary plate provided in the chamber, in such a way that when being lifted the cylinder does progressively close the openings of the diffuser and at the same time opens the openings provided in the downwardly extending edge of said diffuser and directly communicating with the lower region of the chamber where the water outlet orifices have been provided.

[0008] These and other characteristics will be best made apparent by the following detailed description whose understanding will be made easier by the accompanying two sheets of drawings showing a practical embodiment cited only by way of an example not limiting

the scope of the present invention.

[0009] In the drawings:

Fig. 1 is a sectional elevation of the assembly forming this distributor valve;

Fig. 2 is a perspective view of said assembly;

Figs. 3 and 4 show in a plan-view and in a sectional elevation the fast-fixed safety catch of the bayonet lock joining together the body and bonnet, respectively;

Fig. 5 illustrates in a perspective view the distributor valve with the bonnet removed; and

Fig. 6 shows in a perspective view said distributor valve having besides had the intermediary plate with the reducing gear removed.

[0010] According to the drawings the fluid distributor valve has a chamber 1 formed by a circular base body 2 provided to be closed by means of a domed bonnet 3, in said chamber being rotatably installed an intermediary plate 4 fitted around a vertical, central shaft 5 around which a rotor 6 is also fitted in a freely rotatable arrangement, said rotor being actuated by virtue of the action of the fluid flowing into the valve through a bottom opening 7 centrally provided in said body 2, this latter having around said opening fluid outlet orifices 8 being closed by stoppers being each formed by a respective circular flap 9, said flaps being hinged at their innermost end by means of a pin 10 fitting into corresponding forked protrusions 11 of the top surface of body 2.

[0011] These flaps 9 are sequentially raised as they are prised at their end opposite to that of their hinged connection as a ramp 12 passes underneath said flaps, said ramp being formed on the inside of the bottom edge 35 of the periphery 13 of the intermediary plate 4, this latter having fitted on its top surface a reducing gear 15 whose first gear wheel 15a meshes with pinion 6a provided at the end of a top tubular shaft 6b of rotor 6, whereas the last wheel 15b of this gear meshes with an internal gear rim 3a provided on the inner periphery of bonnet 3.

[0012] This valve comprises a central device by means of which the fluid passage from the bottom opening 7 towards the rotor 6 is controlled and can even be blocked if desired in order to thus adjust the time during which the flaps 9 will be held open, and also in order to keep only one of these flaps open when the valve has been arrested.

[0013] This controlling and arresting device consists in a hollow cylinder 16 being integral with the central shaft 5, this latter being vertically shiftable by means of an external control means 17 to which said shaft is fitted at its upper end 5', whereas at its lower end 5" said shaft is supported and guided in a pocket 18 being axially integral with body 2 in its bottom opening 7. Said cylinder 16 is slidably fitted within a diffuser 19 coaxially installed inside rotor 6 and forming part of the intermediary plate 4, in such a way that when being lifted the cylinder 16 does progressively close the peripheral openings 19' of

diffuser 19, and at the same time opens the openings 19" provided in the downwardly extending edge of said diffuser and directly communicating with that region of the valve where the outlet orifices 8 have been provided.

[0014] Flaps 9 have at their outermost end an overhanging appendage 20 with a dihedral lower surface, said appendage being urged by said ramp 12, said flaps having attached to their lower edge a flat seal 21 assuring the tight closure of the fluid outlet orifices 8.

[0015] Bonnet 3 is fitted to body 2 by means of a bayonet lock, for such a purpose the periphery of body 2 having the corresponding angular protrusions 22 provided to fit into the recesses 23 of the periphery of bonnet 3 to which a safety catch 24 has been fitted consisting of a strip 25 having a cross-section in the shape of an inverted L and being provided with a bottom rib 26 by way of a stop limiting the vertical shift of said strip, this latter having its inner surface provided with two horizontal grooves selectively engaging a rib provided on the periphery of bonnet 3 in order to thus fix the locked and unlocked positions in the fitting of bonnet 3 to body 2, in said locked position one of said protrusions 22 of the periphery of body 2 abutting against a peg 27 being integral with strip 25 and slidably fitted into a vertical orifice 28 of the very periphery of bonnet 3.

[0016] The central shaft 5 is lifted and lowered by means of turning the control means 17 formed by an internally threaded knob by way of a nut sliding along an externally threaded neck 29 formed on the top end of bonnet 3.

[0017] At 30 is shown a circular cover fitted to intermediary plate 4 and acting as an upper stop for rotor 6, and at 31 is shown a ring provided to be attached to body 2 and acting as an upper stop for the hinged connection of flaps 9 to said body.

### Claims

1. A fluid distributor valve comprising a chamber (1) formed by a body (2) and a bonnet (3) and having an intermediary plate (4), a central shaft (5) extending through said intermediary plate and having fitted around it a rotor (6) being submitted to the action of the fluid flowing into said chamber, said body having fluid outlet bottom orifices (8) being each closed by a respective stopper, said stoppers being prised open by means activated by a reducing gear (15) connected to said rotor (6); **characterized in that** it comprises a central device that regulates and blocks the fluid passage towards rotor (6), by means of which the fluid passage towards rotor (6) is controlled in order to thus adjust the time during which each outlet (8) will be held open, and also in order to keep a given outlet open and all of the remaining outlets closed when the valve has been arrested and by means of which the fluid passage towards rotor (6) can be completely blocked.

2. A fluid distributor valve as per claim 1, **characterized in that** the central device that regulates and blocks the fluid passage towards rotor (6) consists in a cylinder (16) being integral with the central shaft (15), this latter being vertically shiftable by means of an external control means (17), said cylinder being slidably fitted within a diffuser (19) coaxially installed inside rotor (6) and forming part of the intermediary plate (4), in such a way that when being lifted the cylinder (16) does progressively close the openings (19') of diffuser (19), and at the same time opens the openings (19") provided in the downwardly extending edge of said diffuser and directly communicating with that region of the valve where the outlet orifices (8) have been provided.
3. A fluid distributor valve as per claim 1, **characterized in that** the stoppers of the fluid outlet orifices are each formed by a respective flap (9), said flaps being hinged at an end (10) and being urged at the opposite end by a ramp (12) provided on the inside of the peripheral bottom edge (13) of said intermediary plate (4), this latter rotating because of the engagement of the reducing gear (15) fitted on said plate with an internal gear rim (3a) provided on the inner periphery of bonnet (3).
4. A fluid distributor valve as per claim 3, **characterized in that** said flaps (9) have each attached to their lower surface a respective flat seal (21).
5. A fluid distributor valve as per claim 1, **characterized in that** on the periphery of bonnet (3) a fast-fixed safety catch (24) has been provided to lock said bonnet and body (2) in their mutually engaged position, said safety catch comprising a peg (27) provided to be fitted into an orifice (28) of the periphery of bonnet (3), one of the protrusions (22) of the bayonet lock provided on the outer periphery of body (2) abutting against said peg (27).

### Patentansprüche

45. 1. Verteilerventil für Flüssigkeiten mit einer Kammer (1), bestehend aus einem Körper (2) und einer Abdeckung (3), und mit einer Zwischenplatte (4), durch die eine mittlere Welle (5) läuft, auf die ein Schaufelrad (6) aufgesteckt ist, auf das die in die Kammer einlaufende Flüssigkeit wirkt, wobei dieser Körper auf der Unterseite über Auslassöffnungen (8) verfügt, die wiederum durch entsprechende Verschlüsse verschlossen sind, die bei der Öffnung durch Stellelemente über ein Reduziergetriebe (15) betätigt werden, das wiederum mit dem erwähnten Schaufelrad (6) verbunden ist, **dadurch gekennzeichnet, dass es eine Vorrichtung aufweist, die den Durchlauf der Flüssigkeit zum Schaufelrad (6)**

- regelt und verschließt, wodurch über diese zentrale Vorrichtung der Durchlauf der Flüssigkeit zum Schaufelrad (6) geregelt wird, um den Öffnungszeitpunkt von jedem Auslass (8) sowie die Öffnungs- dauer eines bestimmten Auslasses und den Verschluss aller weiteren Auslässe bei Abschaltung des Ventils zu regeln, wobei über diese zentrale Vorrichtung der Durchlauf der Flüssigkeit zum Schaufelrad (6) vollständig verschlossen werden kann.
2. Verteilerventil für Flüssigkeiten nach Anspruch 1 dadurch gekennzeichnet, dass die zentrale Vorrichtung zur Regulierung und zum Verschluss des Flüssigkeitsdurchlaufs zum Schaufelrad (6) aus einem Zylinder (16) besteht, der mit der mittleren Welle (5) verbunden ist, die in vertikaler Richtung über eine externe Steuerung (17) verstellbar ist, wobei der Zylinder im Innern eines Verteilers (19) läuft, der koaxial im Innern des Schaufelrads (6) installiert und Teil der Zwischenplatte (4) ist, so dass der Zylinder (16) in Aufwärtsbewegung progressiv die Öffnungen (19') des Verteilers (19) verschließt und gleichzeitig die Öffnungen (19') am längeren unteren Rand dieses Verteilers öffnet, die direkt mit jenem Bereich des Ventils verbunden sind, wo sich die Auslassöffnungen (8) befinden.
3. Verteilerventil für Flüssigkeiten nach Anspruch 1 dadurch gekennzeichnet, dass die Verschlüsse der Auslassöffnungen aus Klappen (9) bestehen, die an einem Ende (10) gelenkig sind und am gegenüberliegenden Ende über eine Rampe (12) innen am unteren Umfang (13) der erwähnten Zwischenplatte (4) betätigt werden, die durch den Anschluss des auf der Platte montierten Reduziertriebes (15) über einen Zahnkranz (3a) am inneren Umfang der Abdeckung (3) gedreht wird.
4. Verteilerventil für Flüssigkeiten nach Anspruch 3 dadurch gekennzeichnet, dass die Klappen (9) auf ihrer Unterseite den Anschluss von Dichtungsscheiben (21) aufweisen.
5. Verteilerventil für Flüssigkeiten nach Anspruch 1 dadurch gekennzeichnet, dass am Umfang der Abdeckung (3) eine unverlierbare Sicherung (24) vorhanden ist, die die Verbindung der Abdeckung an den Körper (2) blockiert, dessen Sicherung einen Zapfen (27) aufweist, der in eine Öffnung (28) des Umfangs der Abdeckung (3) eingesetzt wird, wobei einer der Überstände (22) des Bayonettschlusses am Außenumfang des Körpers (2) gegen den Zapfen (27) anläuft.
- Revendications
- Vanne destinée à la distribution des fluides comportant une chambre (1) constituée par un corps (2) et un couvercle (3), présentant une plaque intermédiaire (4) traversée par un axe central (5) dans lequel est introduit une roue (6) qui reçoit l'action du fluide qui entre dans cette chambre, ce corps présentant des orifices (8) inférieurs de sortie du fluide obturés par leurs fermetures respectives, qui sont actionnées en ouverture par des moyens activés par un engrenage réducteur (15) connecté à la roue déjà mentionnée (6), caractérisée par le fait qu'elle comporte un dispositif qui régule et ferme le passage du fluide jusqu'à la roue (6), le passage du fluide vers la roue (6) étant réglé par ce dispositif afin d'échelonner le temps d'ouverture de chaque sortie (8), ainsi que la permanence de l'ouverture d'une sortie déterminée et la fermeture de toutes les autres lors de l'arrêt de la vanne, le passage du fluide vers la roue (6) pouvant être complètement fermé au moyen de ce dispositif central.
  - Vanne destinée à la distribution des fluides, conformément à la revendication 1, caractérisée par le fait que le dispositif central qui régule et ferme le passage du fluide vers la roue (6) consiste en un cylindre (16), solidaire de l'axe central (5) qui peut se déplacer verticalement au moyen d'une commande extérieure (17), dont le cylindre joue à l'intérieur d'un diffuseur (19) installé coaxialement à l'intérieur de la roue (6) et qui fait partie de la plaque intermédiaire (4), de telle sorte que lors de sa montée, le cylindre (16) obture progressivement les ouvertures (19') du diffuseur (19) et ouvre en même temps les ouvertures (19") prévues sur le bord prolongé inférieurement de ce diffuseur, communiquant directement avec la partie de la vanne où se trouvent les orifices (8) de sortie.
  - Vanne destinée à la distribution des fluides, conformément à la revendication 1, caractérisée par le fait que les fermetures des orifices de sortie du fluide sont constituées par leurs manchons respectifs (9), articulés à leur extrémité (10) et actionnés à leur extrémité opposée par une rampe (12) prévue à l'intérieur du bord périphérique inférieur (13) de cette plaque intermédiaire (4), qui tourne à la suite de l'accouplement de l'engrenage réducteur (15) monté sur cette plaque, avec une couronne dentée (3a) prévue à la périphérie interne du couvercle (3)
  - Vanne destinée à la distribution des fluides, conformément à la revendication 3, caractérisée par le fait que les manchons (9) comportent à leur face inférieure l'accouplement des joints plats (21) d'étanchéité respectifs.

5. Vanne destinée à la distribution des fluides, conformément à la revendication 1, **caractérisée par le fait qu'il a été prévu à la périphérie du couvercle (3) une sécurité (24) de sûreté qui bloque l'accouplement de celle-ci avec le corps (2), sécurité qui comporte une broche (27) qui s'introduit dans l'orifice (28) de la périphérie du couvercle (3), broche (27) contre laquelle butte l'une des saillies (22) de la fermeture à baïonnette que présente la périphérie extérieure du corps (2).**

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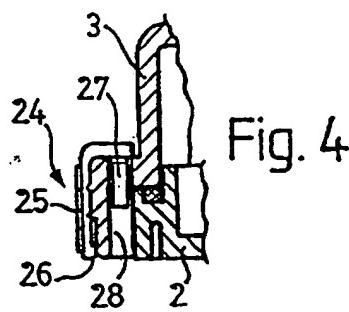
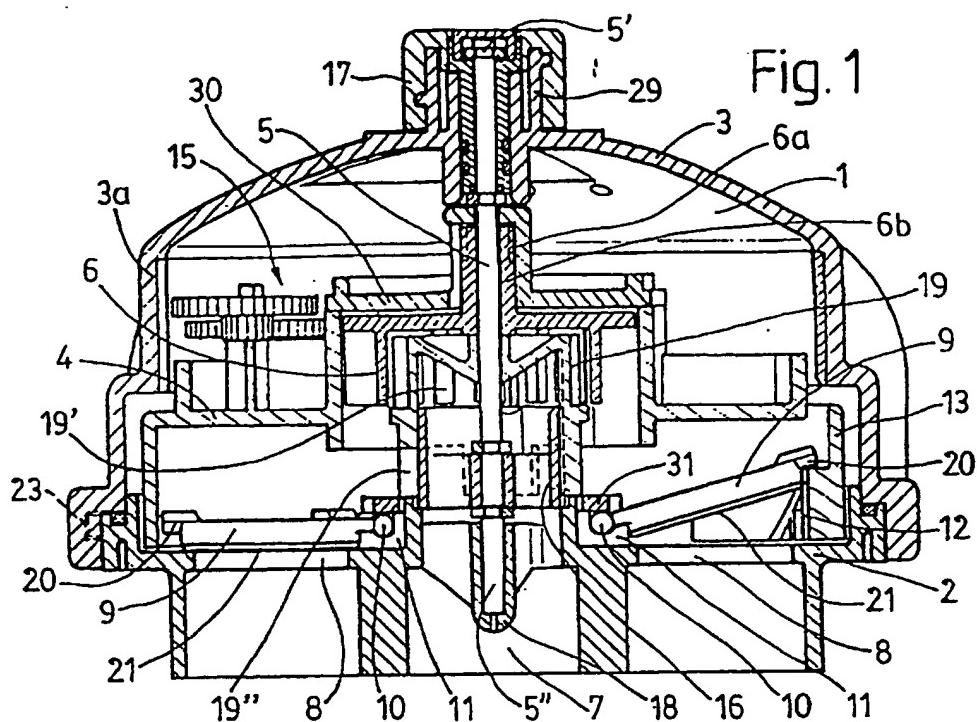


Fig. 2

